

Claims

- [c1] 1. A water screen system comprising:
- a water screen comprising a foraminous belt in a loop extending from a lower end below the surface of a flowing stream to an upper end above the surface of the stream, the belt including an upward-moving upstream portion and a downward-moving downstream portion;
 - the foraminous belt including means for lifting fish at the upstream portion of the belt upward;
 - a dam disposed downstream of the upstream portion of the foraminous belt at the surface of the stream to block the flow of the stream in a region at the surface.
- [c2] 2. A water screen system as in claim 1 wherein the dam extends from above the surface of the stream to below the surface of the stream.
- [c3] 3. A water screen system as in claim 1 wherein the dam floats at the surface of the stream.
- [c4] 4. A water screen system as in claim 1 wherein the means for lifting fish comprises a plurality of spaced

apart flights on the belt, each flight extending on the upstream portion from a point of highest elevation to a point of lowest elevation disposed at a side of the belt.

- [c5] 5. A water screen system as in claim 4 wherein the point of highest elevation of a flight is at the opposite side of the belt from the point of lowest elevation.
- [c6] 6. A water screen system as in claim 4 wherein the point of highest elevation of a flight is at the centerline of the belt and wherein points of lowest elevation are at opposite sides of the belt.
- [c7] 7. A water screen system as in claim 4 wherein the flights form a chevron pattern.
- [c8] 8. A water screen system as in claim 4 wherein the belt is a modular belt constructed of individual belt modules, some of which include a flight segment, and wherein each of the flights is formed of vertically overlapped flight segments of adjacent modules across the width of the belt.
- [c9] 9. A water screen system as in claim 4 wherein the belt is a modular belt constructed of individual belt modules, some of which include a flight segment, and wherein each of the flights is formed by flight segments on adjacent side-by-side modules across the width of the belt.

- [c10] 10. A water screen system as in claim 4 wherein each flight extends perpendicularly from the plane of the belt.
- [c11] 11. A water screen system as in claim 4 wherein each flight includes a lip extending upward from the distal end of the flight to form a scoop with the flight.
- [c12] 12. A water screen system as in claim 1 further comprising a diversion at a side of the stream with a side wall terminating above the surface of the stream in a rim over which the means for lifting fish transfers fish lifted from the stream into the diversion.
- [c13] 13. A water screen system as in claim 1 further comprising debris-collecting members extending outward from the belt.
- [c14] 14. A water screen system as in claim 1 further comprising a second water screen disposed in the stream upstream of the other water screen to form a two-stage filter.
- [c15] 15. A water screen system as in claim 14 wherein the second water screen includes a foraminous belt having openings through its thickness larger than openings through the thickness of the foraminous belt in the downstream water screen.

- [c16] 16. A water screen system as in claim 14 further comprising debris-collecting members extending outward from the second water screen.
- [c17] 17. A water screen system comprising:
a traveling water screen comprising a foraminous belt extending in width from a first edge to a second edge and arranged in a loop having an inner side and an outer side and extending from a lower end below the surface of a flowing stream to an upper end above the surface of the stream, the belt loop including an upward-moving upstream portion and a downward-moving downstream portion;
the foraminous belt including flights on the outer side extending across the width of the belt;
wherein the flights on the upward-moving upstream portion of the belt loop are inclined from a point of highest elevation to a point of lowest elevation disposed at one edge of the belt.
- [c18] 18. A water screen system as in claim 17 wherein the flights on the upward-moving portion extend from a point of highest elevation at the first edge to a point of lowest elevation at the second edge.
- [c19] 19. A water screen system as in claim 17 wherein the

flights on the upward-moving portion extend from a point of highest elevation midway between the first and second edges to points of lowest elevation at the first and second edges.

- [c20] 20. A water screen system as in claim 17 wherein the flights form a chevron pattern.
- [c21] 21. A water screen system as in claim 17 wherein the flights on the upward-moving portion have an inverted-U or inverted-V shape.
- [c22] 22. A water screen system as in claim 17 wherein the flights extend perpendicularly from the outer side of the belt.
- [c23] 23. A water screen system as in claim 17 wherein each flight includes a lip extending upward from the distal end of the flight to form a scoop with the flight.
- [c24] 24. A water screen system as in claim 17 further comprising debris-collecting members extending outward from the outer side of the belt.
- [c25] 25. A water screen system as in claim 17 wherein the foraminous belt is a modular belt including rows of hingedly linked belt modules and wherein each flight extends across the width of an individual belt row.

- [c26] 26. A water screen system as in claim 17 wherein the foraminous belt is a modular belt including rows of hingedly linked belt modules and each flight is formed of flight segments formed on adjacent modules.
- [c27] 27. A water screen system as in claim 17 wherein the foraminous belt is a modular belt including rows of hingedly linked belt modules, some of which include flight segments forming a portion of a flight.
- [c28] 28. A water screen system as in claim 27 wherein the belt modules that include flight segments have a closed outer side to prevent the stream from flowing through those modules.
- [c29] 29. A water screen system as in claim 27 further comprising a dam that moves with the belt.
- [c30] 30. A water screen system as in claim 17 further comprising a trough at a side edge of the belt along the upward-moving, upstream portion for receiving fish from the flights at the point of lowest elevation.
- [c31] 31. A water screen system as in claim 17 further comprising a dam disposed downstream of the upstream portion of the foraminous belt at the surface of the stream to block the flow of the stream in a region at the

surface.

- [c32] 32. A water screen system as in claim 17 further comprising a second water screen disposed in the stream upstream of the other water screen to form a two-stage filter.
- [c33] 33. A water screen system as in claim 32 wherein the second water screen includes a foraminous belt having openings through its thickness larger than openings through the thickness of the foraminous belt in the downstream water screen.
- [c34] 34. A water screen system as in claim 32 further comprising debris-collecting members extending outward from the second water screen.
- [c35] 35. A belt for use as a water screen in a water screen system for lifting fish and debris out of a flowing stream, the belt comprising:
- a series of rows of one or more belt modules, each row extending in a direction of belt travel from a first end to a second end, laterally from a first edge to a second edge, and in thickness from a first side to a second side;
 - hinge pins hingedly interconnecting consecutive rows together end to end into an endless belt;

at least some of the modules forming openings extending from the first side to the second side to allow a stream to flow through the modules;
at least some of the modules including flight segments extending from the first side;
wherein modules with flight segments are arranged adjacently to form flights, each flight extending across the width of the belt and having a leading portion relative to a trailing portion in the direction of belt travel;
wherein the trailing portion is disposed at at least one of the first and second edges of the belt.

[c36] 36. A belt as in claim 35 wherein the flight segments extend obliquely from the first side of the belt.

[c37] 37. A belt as in claim 35 wherein the flight segments include a lip formed at the distal end of the flight segment to form a scoop with the flight segment.

[c38] 38. A belt as in claim 35 wherein each module in a selected belt row includes a flight segment that together with the other flight segments on the row forms an individual flight extending across the width of the row.

[c39] 39. A belt as in claim 35 wherein the leading portion of each flight is at the opposite edge of the belt from the

trailing portion.

- [c40] 40. A belt as in claim 35 wherein the leading portion of each flight is disposed midway between the first and second edges of the belt.
- [c41] 41. A belt as in claim 34 wherein the flights form a chevron pattern.
- [c42] 42. A belt as in claim 35 wherein each flight forms a diagonal across a belt row.
- [c43] 43. A belt as in claim 35 wherein each flight forms an inverted-U or an inverted-V shape with the vertex of the U or V in the trailing portion.
- [c44] 44. A belt as in claim 35 wherein the modules having flight segments lack openings extending from the first side to the second side.
- [c45] 45. A belt for use as a water screen in a water screen system for lifting fish and debris out of a flowing stream, the belt comprising:
- a series of rows of one or more belt modules, each row extending in a direction of belt travel from a first end to a second end, laterally from a first edge to a second edge, and in thickness from a first side to a second side;

hinge pins hingedly interconnecting consecutive rows together end to end into a belt;
at least some of the modules forming openings extending from the first side to the second side to allow a stream to flow through the modules;
a plurality of flights extending across the width of the belt, each having a leading portion relative to a trailing portion in the direction of belt travel;
wherein the trailing portion is disposed at at least one of the first and second edges of the belt.

- [c46] 46. A belt as in claim 45 wherein each flight extends obliquely from the first side of the belt.
- [c47] 47. A belt as in claim 45 wherein each flight includes a lip formed at the distal end of the flight to form a scoop with the flight.
- [c48] 48. A belt as in claim 45 wherein the leading portion of each flight is at the opposite edge of the belt from the trailing portion.
- [c49] 49. A belt as in claim 45 wherein the leading portion of each flight is disposed midway between the first and second edges of the belt.
- [c50] 50. A belt as in claim 45 wherein the flights form a chevron pattern.

- [c51] 51. A belt as in claim 45 wherein each flight forms a diagonal across a belt row.
- [c52] 52. A belt as in claim 45 wherein each flight forms an inverted-U or an inverted-V shape with the vertex of the U or V in the trailing portion.
- [c53] 53. A belt as in claim 45 wherein each flight is formed of flight segments on adjacent belt modules.
- [c54] 54. A belt as in claim 45 wherein each flight is a continuous flight attached to the belt.
- [c55] 55. A belt as in claim 54 wherein each flight is made of a urethane material.